

EOSDIS Core System Project

ECS Project Training Material Volume 1: Course Outline

December 1997

Hughes Information Technology Systems
Upper Marlboro Maryland

ECS Project Training Material Volume 1: Course Outline

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Preface

This document is a contract deliverable with an approval code of 3. As such, it does not require formal Government approval. This document is delivered for information only, but is subject to approval as meeting contractual requirements.

Any questions should be addressed to:

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Abstract

This Training Course Outline provides a series of tasks that will be used to define a comprehensive course of instruction for Version 2.0 of ECS. The training addressed in this outline is related to the specific system design, components and operation of Version 2.0 and does not include training on management and personal development.

Keywords: training, instructional design, courseware, just-in-time, OJT

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Change Information Page

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Page Number		Issue	
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Contents

Preface

Abstract

Introduction

Identification	1
Scope	1
Purpose.....	1
Status and Schedule	1
Organization.....	1

Related Documentation

Parent Document.....	3
Applicable Documents.....	3
Information Documents	3
Information Documents Referenced	3
Information Documents Not Referenced	3

Course Outline

Volume 2: Introduction and System Overview.....	7
Volume 3: Problem Management	10
Volume 4: System Administration.....	11
Volume 5: Network Administration	14
Volume 6: Production Planning and Processing.....	15
Volume 7: Resource Planning.....	17

Volume 8: Ingest.....	19
Volume 9: Data Distribution.....	21
Volume 10: Archive.....	23
Volume 11: Database Administration.....	25
Volume 12: Configuration Management	28
Volume 13: User Services.....	30
Volume 14: Not Used	32
Volume 15: Not Used	32
Volume 16: Science Software Integration & Test	32
Volume 17: System Troubleshooting	36

Version 2.0 Training Schedule

Course Duration	39
Course Layout.....	40

Abbreviations and Acronyms

Introduction

Identification

Training Material Volume 1 is part of Contract Data Requirements List (CDRL) Item 129, whose requirements are specified in Data Item Description (DID) 625/OP3 and is a required deliverable under the Earth Observing System Data and Information System (EOSDIS) Core System (ECS), Contract (NAS5-6000).

Scope

Training Material Volume 1 defines the tasks required to operate ECS. The Operator Training course is designed to provide the operations staff with sufficient knowledge and information to configure and operate the system as well as provide one aspect of the certification process as defined in the Certification Plan (626).

Purpose

The course outline provides a detailed path that forms the basis for curriculum development as well as course conduct. Lesson objectives will be formed using the course outline. The lesson objectives will serve as the basis for Student Guide and slide presentation material development. Once the course outline is completed, curriculum development can be completed and subsequent training courses can be conducted.

Status and Schedule

This lesson module provides detailed information about training for Version 2.0. Subsequent revisions will be submitted as needed.

Organization

This document is organized as follows:

Introduction:	The Introduction presents the document identification, scope, purpose, and organization.
Related Documentation:	Related Documentation identifies parent, applicable and information documents associated with this document.
Course Outline:	This section identifies and defines the lesson topics, duration and scope for the course.
Version 2.0 Training Schedule:	This section provides the weekly training course schedule.

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Related Documentation

Parent Document

The parent document is the document from which this ECS Training Material's scope and content are derived.

423-41-01	Goddard Space Flight Center, EOSDIS Core System (ECS) Statement of Work
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Applicable Documents

The following documents are referenced within this ECS Training Material, or are directly applicable, or contain policies or other directive matters that are binding upon the content of this document:

420-05-03	Goddard Space Flight Center, Earth Observing System (EOS) Performance Assurance Requirements for the EOSDIS Core System (ECS)
423-41-02	Goddard Space Flight Center, Functional and Performance Requirements Specification for the Earth Observing System Data and Information System (EOSDIS) Core System (ECS)

Information Documents

Information Documents Referenced

The following documents are referenced herein and amplify or clarify the information presented in this document. These documents are not binding on the content of the ECS Training Material.

535-TIP-CPT-001	Goddard Space Flight Center, Mission Operations and Data Systems Directorate (MO&DSD) Technical Information Program Networks Technical Training Facility, Contractor-Provided Training Specification
609-CD-003-001	Operations Tools Manual
611-CD-004-001	Mission Operation Procedures for the ECS Project

Information Documents Not Referenced

The following documents, although not referenced herein and/or not directly applicable, do amplify or clarify the information presented in this document. These documents are not binding on the content of the ECS Training Material.

220-TP-001-001	Operations Scenarios - ECS Release B.0 Impacts
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305-CD-020-002	Release B SDPS/CSMS System Design Specification Overview for the ECS Project
305-CD-021-002	Release B SDPS Client Subsystem Design Specification for the ECS Project
305-CD-022-002	Release B SDPS Interoperability Subsystem Design Specification for the ECS Project
305-CD-023-002	Release B SDPS Data Management Subsystem Design Specification for the ECS Project
305-CD-024-002	Release B SDPS Data Server Subsystem Design Specification for the ECS Project
305-CD-025-002	Release B SDPS Ingest Subsystem Design Specification [for the ECS Project
305-CD-026-002	Release B SDPS Planning Subsystem Design Specification for the ECS Project
305-CD-027-002	Release B SDPS Data Processing Subsystem Design Specification for the ECS Project
305-CD-028-002	Release B CSMS Communications Subsystem Design Specification for the ECS Project
305-CD-029-002	Release B CSMS System Management Subsystem Design Specification for the ECS Project
305-CD-030-002	Release B GSFC DAAC Design Specification for the ECS Project
305-CD-031-002	Release B Langley DAAC Design Specification for the ECS Project
305-CD-033-002	Release B EDC DAAC Design Specification for the ECS Project
305-CD-034-002	Release B ASF DAAC Design Specification for the ECS Project
305-CD-035-002	Release B NSIDC DAAC Design Specification for the ECS Project
305-CD-036-002	Release B JPL PO.DAAC Design Specification for the ECS Project
305-CD-037-002	Release B ORNL DAAC Design Specification for the ECS Project
305-CD-038-002	Release B System Monitoring and Coordination Center Design Specification for the ECS Project
305-CD-039-002	Release B Data Dictionary Subsystem Design Specification for the ECS Project
601-CD-001-004	Maintenance and Operations Management Plan for the ECS Project
604-CD-001-004	Operations Concept for the ECS Project: Part 1-- ECS Overview

604-CD-002-003	Operations Concept for the ECS Project: Part 2B -- ECS Release B
605-CD-002-001	Release B SDPS/CSMS Operations Scenarios for the ECS Project
607-CD-001-002	ECS Maintenance and Operations Position Descriptions
500-1002	Goddard Space Flight Center, Network and Mission Operations Support (NMOS) Certification Program, 1/90

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Course Outline

The Operator Training Course is grouped into modular lessons based on common task groupings and operational requirements. Each lesson outline will contain a lesson description, a list of recommended class attendees (by position), Commercial Off-the-Shelf (COTS) hardware (HW) and software (SW) requirements, duration (lab and lecture) and a list of sub-tasks required to satisfy the overall lesson objective. The course consists of the following lessons:

Volume 2: Introduction and System Overview

Volume 2 provides a general overview of the Version 2.0 Earth Observing System Data and Information System (EOSDIS) Core System (ECS). Identification of the hardware and software configurations used to support ECS is covered. Additional information includes an overview of all COTS, system security, selected operational scenarios, database, and external interfaces.

Attendees: All Distributed Active Archive Center (DAAC) ECS Operator and Support personnel, all System Monitoring and Coordination Center (SMC) ECS Operator and Support personnel, all Sustaining Engineer Organization (SEO) & Integrated Logistic Support (ILS) personnel, all Investigator support personnel and all Independent Verification and Validation (IV & V) contractor personnel.

Prerequisites: None.

Duration: 4 Hours (4 Lecture)

Sub-tasks:

1. ECS Overview.
 - a. ECS Mission.
2. ECS Version 2.0.
 - a. V0 data support.
 - b. EOS AM-1 mission support.
 - c. Landsat-7 mission support.
 - d. Meteor 3M-1/SAGE III support.
3. System Functional Overview.
 - a. ECS Data Flow.
 - b. ECS Operations Locations.

4. Operational Software Configuration Overview.
 - a. Science Data Processing Subsystem (SDPS).
 - b. Communications and System Management Subsystem (CSMS).
5. Operation Hardware Configuration Overview.
 - a. ECS Equipment.
 - b. Types of Equipment Involved in ECS Functions.
6. Commercial Off-The-Shelf (COTS) Software Overview.
7. Operational Processes.
 - a. System Operations Management Activities.
 - 1) System Administration.
 - 2) Network Administration.
 - 3) Problem Reporting.
 - 4) System Troubleshooting.
 - 5) Configuration Management.
 - b. Science Operations Activities.
 - 1) Ingest.
 - 2) Archive.
 - 3) Data Distribution.
 - 4) Production Planning.
 - 6) Resource Planning.
 - 7) Database Administration.
 - 8) User Services.
 - 9) Science Software Integration and Test.
8. Desktop Overview

Practical Exercises: The student will perform the following hands-on training exercises:

1. Students will take a tour of the facility.
2. Students will perform an operator logon.
3. Students will become familiar with the standard desktop configuration and uses.

Volume 3: Problem Management

Volume 3 provides a detailed description of the different tasks that are required in order to report a problem. The lesson includes a detailed review of the trouble ticket process.

Attendees: All DAAC ECS Operator and Support personnel, all SMC ECS Operator and Support personnel, all SEO & ILS personnel, all Investigator support personnel and all IV & V contractor personnel.

Prerequisites: Introduction and System Overview lesson.

Duration: 2 Hours (1 Lecture, 1 Lab)

Sub-tasks:

1. Trouble Ticket.
 - a. Introduction.
 - b. Writing a Trouble Ticket (TT).
 - c. Documenting changes.
 - d. Problem resolution.
 - e. Preparing and processing a TT through the Failure Review Board.
 - f. Making emergency fixes.

Practical Exercises: The student will perform the following hands-on training exercises:

1. Students will write a Trouble Ticket (TT).
2. Students will document TT changes.

Volume 4: System Administration

Volume 4 provides a detailed description of the different tasks that are required in order to perform system administration of ECS. The lesson includes a detailed review of the initial program loads for all system upgrades, mode management, performing COTS administration, performing system backups and restores, adding/modifying user accounts, assigning access privileges, server startup/shutdown, performing general security features, ESOD administration and workstation installation.

Attendees: SMC System Administrators, DAAC System Administrators, DAAC Computer Operator and DAAC System Engineer.

Prerequisites: Introduction/System Overview and Problem Reporting lessons.

Duration: 8 Hours (4 Lecture, 4 Lab)

Sub-tasks:

1. System startup and shutdown.
2. Mode Management.
 - a. Application management.
 - b. Mode activation.
 - c. Mode termination.
3. Tape operations.
4. System backup and restore process.
 - a. Performing incremental backup.
 - b. Performing full backup.
 - c. Performing file restore.
 - d. Performing complete system restore.
5. System log maintenance.
6. User administration.
 - a. Adding a user.
 - b. Deleting a user.
 - c. Changing a user account configuration.
 - d. Changing a user access privileges.

- e. Changing a user password.
 - f. Checking a file/directory access privilege status.
 - g. Changing a file/directory access privilege.
 - h. Checking a user account file access privilege.
 - i. Changing a user account file access privilege.
 - j. Moving a user's home directory.
7. COTS Administration.
- a. COTS installation.
 - b. Log files.
 - c. COTS configuration.
8. New Workstation Installation.
- a. Preparation.
 - b. Installation.
 - c. Testing and Verification.
9. DCE Configuration.
- a. Initial Cell.
 - b. Configuring DTS Servers.
 - c. Additional CDS Servers.
 - d. DTS Clerks.
 - e. CDS Servers.
 - f. Creating a Security Server Replica.
 - g. Unconfiguring DCE Client.
10. Security.
- a. Running security management log analysis program.
 - b. Generating security reports.
 - c. Reviewing user activity data.
 - d. Monitoring user audit trail information.
 - e. Reviewing and Verifying data encryption functionality.
 - f. Reviewing and Verifying MSS site security management application service.

- g. Security Violations
 - d. Recovery of site security compromises.
- 11. ESOD Administration.
 - a. Listing a moderation group.
 - b. Creating a group.
 - c. Updating a moderation group.
 - d. Deleting a moderation group.

Practical Exercises: The student will perform the following hands-on training exercises:

1. Students will perform a server startup and shutdown.
2. Students will perform mode management.
3. Students will perform an incremental backup.
4. Students will perform a file restore.
5. Students will add a user account.
6. Students will change a user's access privileges.
7. Students will change a file/directory access privilege.
8. Students will change a user account file access privilege.
9. Students will generate security reports.
10. Students will access and review COTS log files.
11. Students will configure COTS subdirectories.
12. Students will install a new workstation.
13. Students will delete a user account.
14. Students will create a moderation group.
15. Students will delete a moderation group.

Volume 5: Network Administration

Volume 5 provides a detailed description of the different tasks that are needed in order to monitor the performance of the network. The Network Administration lesson includes a review of the network configuration and topology, network performance monitoring, inter-DAAC network issues and network fault analysis.

Attendees: SMC System Administrator, SMC Network Analyst, DAAC System Administrator, DAAC Resource Manager, DAAC System Engineer.

Prerequisites: Introduction/System Overview and Problem Reporting lessons.

Duration: 8 Hours (4 Lecture, 4 Lab)

Sub-tasks:

1. Network Administration.
 - a. Network Node Manager (NNM).
 - b. Starting and ending a NNM session.
 - c. Reading NNM map and submaps.
 - d. Defining network objects and symbols.
 - e. Adding a segment object.
 - f. Adding an IP interface object.
 - g. Viewing current network and system configuration.
 - h. Viewing network address information.
 - i. Viewing how traffic is routed on a network.
 - j. Viewing the services available on a node.
 - k. System monitoring

Practical Exercises: The student will perform the following hands-on training exercises:

1. Students will start a Network Node Manager session.
2. Students will add a network object, segment object, node object and IP interface object.
3. Students will view current network and system configuration, network address information, traffic routing and address information.

Volume 6: Production Planning and Processing

Volume 6 provides a detailed description of the process for creating, modifying, and implementing a production plan for a site, reviewing production rules, managing all planning-related data, monitoring the quality of the production data, implementing plans and recovery procedures and managing subscriptions.

Attendees: DAAC Production Monitor, DAAC Production Planner, DAAC Resource Planner, DAAC System Engineer, DAAC System Test Engineer, DAAC SW Maintenance Engineer, DAAC Science Coordinator, DAAC Science Software I&T Support Engineer and DAAC User Services Representative.

Prerequisites: Introduction/System Overview and Problem Reporting lessons.

Duration: 12 Hours (6 Lecture, 6 Lab)

Sub-tasks:

1. Launching Production Planning applications.
2. Creating/updating a production request.
3. Creating a new production plan.
4. Reviewing data processing requests.
5. Reviewing a production plan timeline.
6. Launching Production Processing applications.
7. Configuring Autosys screens/displays.
8. Reviewing hardware status, Data Processing Request (DPR) dependency, DPR production timeline, alarms, and job activities.
9. Modifying job priority.
10. Modifying job status.
11. Reviewing activity and job dependency logs.
12. Generating production reports.
13. Defining and running monitors/browsers.
14. Changing the database maintenance time.
15. Performing science product quality assurance (QA).

Practical Exercises: The student will perform the following hands-on training exercises:

1. Students will create a new production request.
2. Students will create a new production plan.
3. Students will review a data processing request.
4. Students will review a plan timeline.
5. Students will configure Autosys screens/displays.
6. Students will review hardware status.
7. Students will review DPR dependency.
8. Students will review DPR production timeline.
9. Students will review alarms and configure alarm selection.
10. Students will review job activities and job selection criteria.
11. Students will modify job priority.
12. Students will modify job status.
13. Students will create activity and job dependency logs.
14. Students will generate production reports.
15. Students will generate custom production reports.
16. Students will generate autosys reports.
17. Students will define and run monitors/browsers.
18. Students will perform science product quality assurance (QA).

Volume 7: Resource Planning

Volume 7 provides a detailed description of how to define production resources to the planning subsystem, integrate all resource requests into a resource plan for a site and schedule/distribute all resources on a daily, weekly and monthly basis.

Attendees: SMC Resource Controller, SMC Fault Manager, DAAC Production Monitor, DAAC Resource Manager, DAAC Production Planner, DAAC Resource Planner, DAAC System Engineer, DAAC System Test Engineer, DAAC SW Maintenance Engineer, DAAC Science Coordinator, DAAC Science Software I&T Support Engineer and DAAC User Services Representative.

Prerequisites: Introduction/System Overview and Problem Reporting lessons.

Duration: 4 Hours (2 Lecture, 2 Lab)

Sub-tasks:

1. Resource planning process.
2. Launching resource planning applications
3. Creating a resource reservation request.
 - a. Editing a resource reservation request.
 - b. Validating or rejecting a resource reservation request.
 - c. Approving a resource reservation request.
 - d. Committing a resource reservation request.
 - e. Deleting a resource reservation request.
4. Reviewing a resource timeline
5. Generating resource planning reports.
6. Defining resources.
 - a. Adding resources.
 - b. Modifying a resource.
 - c. Deleting a resource.
 - d. Synchronizing resource listings.

Practical Exercises: The student will perform the following hands-on training exercises:

1. Students will create a resource reservation request.
2. Students will edit a resource reservation request.

3. Students will validate a resource reservation request.
4. Students will approve a resource reservation request.
5. Students will commit a resource reservation request.
6. Students will delete a resource reservation request.
7. Students will review a resource timeline.
8. Students will generate resource planning reports.
9. Students will add, modify, and delete resources to the resource planning list.
10. Students will synchronize resource listings.

Volume 8: Ingest

Volume 8 provides a detailed description of the process for receiving, logging and marking all hard media for processing and storage in the ECS system. It includes methods for monitoring performance of data requests, managing/processing ingest data, and ingesting hard media/metadata.

Attendees: DAAC Archive Manager, DAAC Ingest Distribution/Technician, DAAC System Engineer, DAAC System Test Engineer and DAAC User Services Representative.

Prerequisites: Introduction/System Overview and Problem Reporting lessons.

Duration: 4 Hours (2 Lecture, 2 Lab)

Sub-tasks:

1. Ingest Function.
2. Launching Ingest Applications.
3. Ingest status monitoring.
 - a. Monitoring/controlling Ingest requests.
 - b. Viewing the Ingest history log.
4. Ingest tunable parameters.
 - a. Modifying external data provider information
 - b. Modifying system parameters
 - c. Performing file transfers
5. Ingest processing.
 - a. Creating a Data Availability Notice (DAN).
 - b. Performing automated network ingest.
 - c. Polling ingest.
 - d. Monitoring user ingest status.
 - e. Recovery from a faulty DAN.
 - f. Recovery from a data ingest failure.
 - g. Performing hard media ingest.
 - h. Performing interactive Ingest.
 - i. Performing document Ingest.

Practical Exercises: The student perform the following hands-on training exercises:

1. Students will monitor/control ingest.
2. Students will view the history log.
3. Students will modify system parameters.
4. Students will modify external data provider/interactive user information.
5. Students will generate a DAN using HTML.
6. Students will recover from a faulty DAN.
7. Students will recover from data ingest failures.
8. Students will perform hard media ingest.
9. Students will perform document ingest.

Volume 9: Data Distribution

Volume 9 provides information to support the operators in distributing data to users on a variety of media. This lesson describes the process for distribution of products to the user community.

Attendees: DAAC Archive Manager, DAAC Ingest/Distribution Technician, DAAC System Engineer, DAAC System Test Engineer, DAAC SW Maintenance Engineer and DAAC User Services Representative.

Prerequisites: Introduction/System Overview and Problem Reporting lessons.

Duration: 4 Hours (2 Lecture, 2 Lab)

Sub-tasks:

1. Distribution concepts.
2. Distribution request operations.
 - a. Launching data distribution applications.
 - b. Monitoring data distribution requests.
3. Network data distribution operations.
 - a. Monitoring electronic FTP shipments.
 - b. Setting the automatic delete function.
4. Physical media operations.
 - a. Loading and unloading tapes.
 - b. Correcting tape faults.
 - c. Creating labels.
 - d. Performing QC of hard media.
 - e. Preparing hard media products for shipment.

Practical Exercises: The student perform the following hands-on training exercises:

1. Students will monitor data distribution requests
2. Students will monitor electronic FTP shipments.
3. Students will set the automatic delete function.
4. Students will load and unload tapes.
5. Students will correct tape faults.
6. Students will create labels.
7. Students will perform QC of hard media.

Volume 10: Archive

Volume 10 reviews the process for archiving data. This lesson includes a description of processing for monitoring the ingest/archival/distribution performance, maintaining configuration of peripherals and data servers, documenting archive errors, maintaining archive processing queue (both storing and retrieval), managing archive content and capacity, submitting new data archive requests to the Science Coordinator and providing archive status.

Attendees: DAAC Archive Manager, DAAC Ingest Distribution Technician, DAAC System Engineer, DAAC System Test Engineer, DAAC SW Maintenance Engineer and DAAC User Services Representative.

Prerequisites: Introduction/System Overview and Problem Reporting lessons.

Duration: 6 Hours (3 Lecture, 3 Lab)

Sub-tasks:

1. Starting and shutting down AMASS
2. Inserting data into the archive.
 - a. Subsetting. (Not available for Drop 2)
3. Monitoring archive request.
4. Retrieving data from the archive.
5. Deleting pull disk data.
6. Loading archive media
7. Backup of Archive Data to offsite storage.
8. Restoring archive data from offsite storage.
9. Monitoring archive system and fault notification.
10. Monitoring temporary data storage of intermediate files.

Practical Exercises: The student perform the following hands-on training exercises:

1. Students will start and shut down the AMASS
2. Students will monitor insertion of data into the archive.
3. Students will monitor an archive request.
4. Students will monitor retrieval of data from the archive.
5. Students will delete pull disk data.
6. Students will load archive media
7. Students will prepare copies of archive data for offsite storage.
8. Students will restore archive data from offsite storage.
9. Students will monitor archive system and perform fault notification.
10. Students will monitor temporary data storage of intermediate files.

Volume 11: Database Administration

Volume 11 provides a functional overview of the ECS databases and detailed description of the tasks required to maintain the database system including the operations interface to perform database administration, product installation and disk storage management, backup and recovery, managing SQL server login accounts and privileges, database tuning and performance monitoring, database security and auditing, database integrity monitoring, and database troubleshooting.

Attendees: DAAC Database Administrator, DAAC Science Data Specialist, DAAC System Engineer, DAAC System Test Engineer, DAAC SW Maintenance Engineer and DAAC User Services Representative.

Prerequisites: Introduction/System Overview and Problem Reporting lessons.

Duration: 8 Hours (4 Lecture, 4 Lab)

Sub-tasks:

1. Database functions and descriptions.
2. Starting and stopping the SQL server.
3. Product Installation and Disk Storage Management.
 - a. Index physical allocation of databases.
 - b. Create new database devices.
 - c. Create user databases.
 - a. Making database size estimates and planning.
 - b. Preparing database-unique attributes.
 - c. Preparing database reports.
 - d. Create database segments.
 - e. Manage and monitor the use of available disk space, memory, connection error logs, state of transaction logs, device problems, etc.
4. Backup and recovery.
 - a. Performing full backup.
 - 1) Frequency and schedule.
 - 2) Backup media and storage.
 - 3) Dump database command.
 - b. Performing incremental backup.
 - 1) Frequency and schedule.

- c. Using backup media and storage.
 - d. Using the dump transaction command
 - e. Performing recovery.
 - 1) Recovery mechanisms.
 - 2) System failure.
 - 3) Sybase SQL server automatic recovery.
 - f. Responding to media failure.
 - 1) Restoration of database.
 - 2) Load transaction command.
 - 3) Load database command.
5. SQL server login accounts and privileges.
- a. Creating/deleting user accounts.
 - b. Granting and revoking access privileges for data retrieval, insertion, deletion and update of objects.
 - c. Granting and revoking roles for SQL server users groups.
6. Database tuning and performance monitoring.
- a. Design and indexing.
 - b. Responding to queries.
 - c. Monitoring and boosting performance.
7. Database security and auditing.
8. Database integrity monitoring.
9. Database troubleshooting.

Practical Exercises: The student will perform the following hands-on training exercises:

1. Students will start the server.
2. Students will create new database devices.
3. Students will create user databases.
4. Students will create database segments.
5. Students will perform database backup.
6. Students will perform database recovery.
7. Students will create a user account and assign account privileges.
8. Students will perform database tuning and performance monitoring.
9. Students will perform integrity monitoring.
10. Students will perform database security and auditing.
11. Students will delete user account.
12. Students will shutdown the server.

Volume 12: Configuration Management

Volume 12 provides a detailed description of the different tasks that need to be accomplished in order to: record and manage proposed and approved Configuration Change Requests (CCR); record, report, manage and distribute changes to custom ECS software, science software and database control files; record, report and maintain system-level changes to the as-built operational baseline; generate the Configuration Status Accounting Records (CSAR); manage, enter, maintain and update documents related to the operational baseline.

Attendees: SMC Configuration Management Administrator, DAAC Configuration Management Administrator and DAAC SW Maintenance Engineer.

Prerequisites: Introduction/System Overview and Problem Reporting lessons.

Duration: 8 Hours (4 Lecture, 4 Lab)

Sub-tasks:

1. M&O role in ECS CM activities
2. Configuration Control Board (CCB) process.
3. Configuration Change Requests (CCR) process.
4. Software baselines and changes.
5. Hardware baselines and changes.
6. Changes to the baseline.
 - a. Physical asset management and monitoring.
 - b. Baseline management.
 - c. Inventory Logistic Maintenance (ILM) management.
7. Impact analysis.

Practical Exercises: The student will perform the following hands-on training exercises:

1. Students will generate a CCR for hardware upgrade.
2. Students will generate a CCR for a software change.
3. Students will generate a CCR to document hardware and software changes.
4. Students will prepare distribution lists for review of the proposed changes.
5. Students will use ClearCase to process the transfer and installation of a software patch.
6. Students will perform updates to the baseline manager for software change.
7. Students will perform updates to the inventory/logistical management system for a hardware change.

Volume 13: User Services

Volume 13 provides a detailed description of the different tasks that relate to providing support to the user community. The type of services reviewed in this lesson include user account management, processing an order, canceling an order, fulfilling subscriptions, cross-DAAC referral process, and cross-DAAC order tracking.

Attendees: DAAC User Services Representative, DAAC System Engineer, DAAC System Test Engineer and DAAC SW Maintenance Engineer.

Prerequisites: Introduction/System Overview and Problem Reporting lessons.

Duration: 8 Hours (4 Lecture, 4 Lab)

Sub-tasks:

1. The User Services Role.
 - a. Identify major user services responsibilities.
 - b. Relate “super user” activities to user support.
2. ECS user account management.
 - a. Retrieving a user account.
 - b. Creating a user account.
 - c. Creating an account from Uniform Resource Locator (URL) registration.
 - d. Editing/Modifying an existing account.
 - e. Deleting an ECS account.
 - f. Canceling an ECS account.
 - g. Changing an ECS user’s password.
3. Processing an Order.
 - a. Creating/Updating a user contact log record.
 - b. Verifying an account with the User Profile screen.
 - c. Data search and order.
 1. Advertising service usage.
 - d. Update User Contact Log.
4. Canceling an order.
 - a. ECS Order Tracking.

- b. Canceling the order.
- 5. Fulfilling a subscription.
 - a. Fulfilling a one-time subscription.
 - b. Fulfilling an open-ended subscription.
 - c. Returning a list of subscriptions.
 - d. Canceling a subscription.
- 6. Cross-DAAC referral processing.
 - a. Referral to another DAAC.
 - b. Receiving a referral from another DAAC.
- 7. Cross-DAAC order tracking.
 - a. Tracking to another DAAC.
 - b. Responding to a tracking request from another DAAC.
- 8. ASTER DAR creation and submission (EDC only).

Practical Exercises: The student will perform the following hands-on training exercises:

- 1. Students will list five major responsibilities of User Services.
- 2. Students will retrieve a user account.
- 3. Students will create a user account.
- 4. Students will creating a user contact log entry.
- 5. Students will retrieve user information.
- 6. Students will locate data via the search and order tool.
- 7. Students will order Data.
- 8. Students will update the user contact log.
- 9. Students will cancel an order.
- 10. Students will fulfill a one-time subscription.
- 11. Students will fulfill an open ended subscription.
- 12. Students will return a list of subscriptions.
- 13. Students will cancel a subscription.
- 14. Students will perform cross-DAAC order tracking.
- 15. Students will create and submit an ASTER DAR (EDC only).

Volume 14: Not Used

Volume 15: Not Used

Volume 16: Science Software Integration & Test

Volume 16 provides a detailed description of the process required to acquire an algorithm package, create Earth Science Data Types, check the science software, compile and link the science software, run a PGE in a simulated SCF environment, examine the PGE produced log files, perform file comparison, update the PDPS database and IMF data server, integrate science software into the EOSDIS environment, test the new science software to verify its operability and advertise the availability of the PGE data using the ESOD.

Attendees: DAAC Science Software I&T Support Engineer, DAAC Science Data Specialist, DAAC System Engineer, DAAC Production Planner, DAAC Production Monitor, DAAC Resource Manager and DAAC SW Maintenance Engineer.

Prerequisites: Introduction/System Overview and Problem Reporting lessons.

Duration: 16 Hours (4 Lecture, 4 Lab)

Sub-tasks:

1. Acquiring and Unpacking the Delivered Algorithm Package.
2. Science Software Configuration Management
 - a. Creating and using a view in ClearCase.
 - b. Creating a new directory into ClearCase.
 - c. Importing files into ClearCase.
 - d. Checking out a file from ClearCase.
 - e. Checking a modified element into ClearCase.
3. Preparing Earth Science Data Types (ESDT).
 - a. Comparing granule level metadata.
 - b. Creating a new ESDT.
 - c. Registering an ESDT.
 - d. Validating ESDT registration.
4. Science Software Integration and Test (SSI&T) Manager Graphical User Interface (GUI).
 - a. Performing initial setup of SSI&T manager.
 - b. Setup of the checklist for SSI&T manager.

- c. Configuration of the SSI&T Manager
 - d. Routine running of the SSI&T manager.
- 5. Standards Checking.
 - a. Checking FORTRAN 77 and 90 standards compliance.
 - b. Checking C standards compliance.
 - c. Checking Ada compliance.
 - d. Prohibited function checker.
 - e. Checking process control files.
- 6. Compiling and Linking.
 - a. Updating the process control file.
 - b. Setting up a SDP Toolkit environment.
 - c. Linking a PGE with SCF version of SDP Toolkit.
 - d. Linking a PGE with DAAC version of SDP toolkit.
 - e. Linking the PGE to the Status Message Facility (SMF) file.
- 7. Updating the PDPS Database and data server.
 - a. Operational metadata population.
 - b. Science metadata population.
 - c. Inserting science software archive package into the data server.
 - d. Inserting static files into data server.
 - e. Inserting executables into data server.
- 8. Running a PGE in a simulated SCF environment.
 - a. Setting up the environment for running the PGE.
 - b. Running and profiling the PGE.
- 9. Examining PGE produced log files.
- 10. File comparison and data visualization.
 - a. Using the GUI HDF file comparison tool.
 - b. Using the hdiff HDF file comparison tool.
 - c. Using the ASCII file comparison tool.
 - d. Using the binary file difference assistant.
 - e. Data Visualization

- f. Viewing product-created metadata with EOSView tool.
 - g. Viewing product data with EOSView tool.
- 11. Updating the PDPS database and IMF data server.
 - a. PDPS database update.
 - b. Update PDPS/SSIT database with ESDT science metadata.
 - c. Update PDPS/SSIT database with PGE science metadata.
 - d. SSIT Operational metadata update GUI.
 - e. Insert (static files, test dynamic files EXE TAR files) into the IMF data server database.
- 12. PGE planning and processing.
 - a. Registering subscriptions, submitting production requests, planning and processing following defined production rules.
 - b. Registering subscriptions for test data files.
 - c. Creating a new production request.
 - d. Creating and activating a production plan.
 - e. Processing.
- 13. Perform post-production activities and troubleshooting.
 - a. Viewing product created metadata using EOSView tool.
- 14. ESOD moderation.
 - a. Accessing ESOD.
 - b. ESOD home screen.
 - c. Displaying a request.
 - d. Processing a request.

Practical Exercises: The student will perform the following hands-on training exercises:

- 1. Students will acquire and unpack a DAP
- 2. Students will create a new directory using ClearCase.
- 3. Students will import files into ClearCase.
- 4. Students will create and register an ESDT.
- 5. Students will perform standards checking.

6. Students will check files using the Prohibited Function Checker
7. Students will check process control files.
8. Students will compile and link a PGE with SCF version of the SDP toolkit.
9. Students will compile and link a PGE with DAAC version of the SDP toolkit.
10. Students will update the PDPS database with operational metadata, and science metadata.
11. Students will update the data server with static files and executable files.
12. Students will execute a PGE in a simulated SCF environment.
13. Students will compare the results with known results and view the product using the EOSView tool.
14. Students will register a PGE.
15. Students will update the PDPS database with ESDT science metadata, PGE science metadata and SSIT operational metadata.
16. Students will update the IMF data server with static files.
17. Students will generate a Data Processing Request.
18. Students will monitor execution of DPRs and chains of DPRs within the PDPS.
19. Students will perform file comparison for an HDF, ASCII and Binary file.
20. Students will view product-created metadata using EOS View tool.
21. Students will view granule and data dictionary metadata.
22. Students will perform PGE troubleshooting.
23. Students will access ESOD.
24. Students will modify a request.
25. Students will create a moderation group.
26. Students will delete a moderation group.

Volume 17: System Troubleshooting

Volume 17 provides a detailed description of the different tasks that are required in order to perform system troubleshooting. The lesson includes a detailed review of the system monitoring capabilities, troubleshooting process and trouble ticket set-up and processing.

Attendees: SMC & DAAC Computer Operator, SMC & DAAC System Administrators, SMC Fault Manager, SMC & DAAC Maintenance Coordinator, DAAC System Engineer, DAAC System Test Engineer, DAAC SW Maintenance Engineer and DAAC User Services Representative.

Prerequisites: Introduction/System Overview and Problem Reporting lessons.

Duration: 8 Hours (2 Lecture, 6 Lab)

Sub-tasks:

1. System/Performance monitoring.
 - a. Checking the health and status of the network.
 - 1) Looking at maps for color alerts.
 - 2) Looking at maps for new nodes.
 - 3) Creating special submaps for monitoring status.
 - 4) Checking for event notifications.
 - b. Accessing the EOSDIS Backbone Network (Ebnet) Web Page.
2. Problem analysis/troubleshooting.
 - a. Analysis/troubleshooting System.
 - b. Analysis/troubleshooting COTS hardware.
 - c. Performing preventive maintenance.
3. Trouble Ticket (TT).
 - a. Using remedy.
 - 1) Adding Users to Remedy.
 - 2) Changing Privileges in Remedy.
 - 3) Changing Remedy Configuration.
 - 4) Generating Trouble Ticket Reports
 - b. Performing operational work-around.

4. Diagnosing network communications problems.
 - a. Identifying network connectivity problems.
 - b. Diagnosing network performance problems.
 - c. Diagnosing network service problems.
 - d. Viewing Historical Trends.

Practical Exercises: The student perform the following hands-on training exercises:

1. Students will perform system monitoring.
2. Students will perform a diagnostic check on the system.
3. Students will add users to Remedy.
4. Students will change privileges in Remedy.
5. Students will change Remedy configuration.
6. Students will configure manager system via the network node manager on the server to monitor the network.

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Version 2.0 Training Schedule

Course Duration

Table 1 provides a summary of the course duration. This summary is tied to the duration of each lesson and reflects the lecture to lab ratio for each lesson.

TABLE 1. COURSE DURATION SUMMARY

LESSON	DURATION (Hrs)	LECTURE/LAB (Hrs)
Introduction and System Overview	4	4/0
Problem Management	4	2/2
System Administration	16	8/8
Network Administration	8	4/4
Database Administration	8	4/4
Production Planning and Processing	12	4/8
Resource Planning	4	2/2
Ingest	4	2/2
Data Distribution	4	2/2
Archive	8	4/4
Configuration Management	8	4/4
User Services	8	4/4
Science Software I&T	16	8/8
System Troubleshooting	8	2/6
TOTAL	112	54/58

Course Layout

The total number of course hours equates to 112 or 14 days. Tables 2 through 4 reflect a proposed layout for each week of the 112 hour training course. Due to the modular nature of each lesson, this schedule can be altered. In order for this approach to work, the following requirements must be followed.

- Attendees must be made available during their required lessons.
- Equipment must be made available to support the lab duration.
- A classroom must be made available to support the lecture.

TABLE 2. WEEK ONE

Time	Monday	Tuesday	Wednesday	Thursday	Friday
8-9	Introduction and System Overview	System Admin	System Admin	Network Admin	Database Admin
9-10					
10-11					
11-12	↓	↓	↓	↓	↓
12-1	Lunch	Lunch	Lunch	Lunch	Lunch
1-2	Problem Reporting	System Admin	System Admin	Network Admin	Database Admin
2-3					
3-4					
4-5	↓	↓	↓	↓	↓

TABLE 3. WEEK TWO

Time	Monday	Tuesday	Wednesday	Thursday	Friday
8-9	Ingest	SSI&T	SSI&T	Resource Planning	Production Planning and Processing
9-10					
10-11					
11-12	↓	↓	↓	↓	↓
12-1	Lunch	Lunch	Lunch	Lunch	Lunch
1-2	Data Distribution	SSI&T	SSI&T	Production Planning and Processing	Production Planning and Processing
2-3					
3-4					
4-5	↓	↓	↓	↓	↓

TABLE 4. WEEK THREE

Time	Monday	Tuesday	Wednesday	Thursday	Friday
8-9	Archive	User Services	Configuration Management	System Troubleshooting	
9-10					
10-11					
11-12	↓	↓	↓	↓	
12-1	Lunch	Lunch	Lunch	Lunch	
1-2	Archive	User Services	Configuration Management	System Troubleshooting	
2-3					
3-4					
4-5	↓	↓	↓	↓	

Abbreviations and Acronyms

AM-1	EOS AM Mission spacecraft 1, morning spacecraft series—ASTER, CERES, MISR, MODIS and MOPITT instruments
API	Applications Program Interface
CBT	Computer Based Training
CDR	Critical Design Review
CDRL	Contract Data Requirements List
CM	Configuration Management
COTS	Commercial Off-the-Shelf
CR	Classroom presentation equipment
CSCI	Computer Software Configuration Item
DAAC	Distributed Active Archive Center
DBA	Database Administration
DCN	Document Change Notice
DID	Data Item Description
ECS	EOSDIS Core System
EOC	EOS Operations Center
EOSDIS	Earth Observing System Data Information System
HW	Hardware
IDR	Interim Design Release
ILS	Integrated Logistics Support
IV&V	Independent Verification and Validation
LSM	Local System Management
M&O	Maintenance and Operations
MSS	Management Subsystem
NASA	National Aeronautics and Space Administration
NMOS	Network and Mission Operations Support

PDR	Preliminary Design Review
PI	Principle Investigator
QA	Quality Assurance
QO	Quality Office
S/C	Spacecraft
SCDO	Science and Communications Development Office
SE	Sustaining Engineering
SEO	Sustaining Engineering Organization
SMC	System Monitoring and Coordination Center
SME	Subject Matter Expert
SMO	System Management Office
SSI&T	Science Software Integration and Test
SW	Software
T ³	Train-the-Trainer